

REMARKS

Applicants are amending the independent claims to clarify that the claims are directed to a method of manufacturing an electroluminescence display device. Applicants are also amending Claims 98 so that the language in it is similar to the other pending claims.

Applicants will address each of the Examiner's rejections in the order in which they appear in the Office Action.

Claim Rejections - 35 USC §103

Claims 20-22, 44, 45, 48, 63, 70 and 74

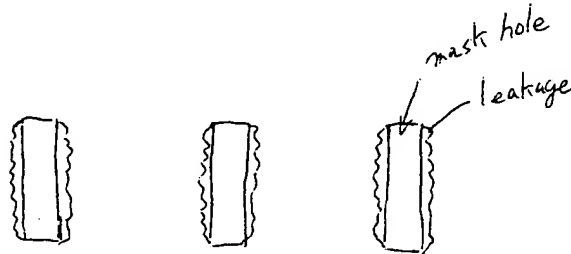
In the Office Action, the Examiner rejects Claims 20-22, 44, 45, 48, 63, 70 and 74 under 35 USC §103(a) as being unpatentable over Arai et al. (US 5,817,366) in view of Grothe et al.¹, Monk (US 4,187,801) and Nagayama et al. (US 5,701,055). This rejection is respectfully traversed.

In the Office Action, the Examiner states that these claims are rejected for the same reasons as set-forth under this heading in the prior Office action (i.e. Final Rejection of July 26, 2005). The Examiner is basing this rejection on the combination of four different references to arrive at the claimed invention. After meeting with the Examiner and discussing the case with him, Applicants respectfully disagree with this rejection and submit that the claims are non-obvious. Further, Applicants can show evidence of the non-obviousness of the claimed invention.

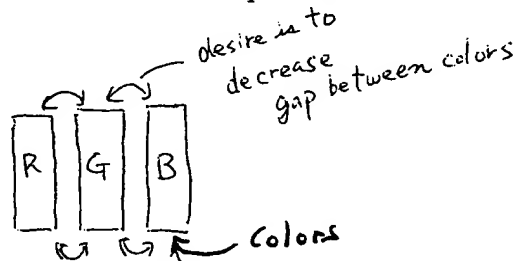
The claimed invention is directed to a highly advantageous method for manufacturing a display device. In fact, with the claimed method, the uniformity of the film thickness can be

¹ Applicants assume that this is US Patent No. 3,931,490, as opposed to US 3,391,490 cited in the Office Action.

greatly improved. In prior devices, the substrate and the mask are stationary, and it takes a considerable period of time to apply a layer. Because it takes so long to apply a layer, not only is the area within the mask hole coated, but the areas under the edges of the mask are also coated.



In contrast, with the claimed method, because of the relative movement of the substrate, the coating of the mask area is not for a very long period. As a result, there is minimal coating under the edges of the mask. This is a very important feature for increasing the number of pixels on a display which is very important for a high definition display. Further, it is desirable to decrease the gap between colors to decrease space and therefore increase the number of pixels.



However, if there is leakage (i.e. wherein the areas under the edges of the mask are also coated), a significant gap has to be left between the colors to account for this leakage, and the gap between the colors cannot be decreased. Therefore, the colors cannot be moved closer to one another and the number of pixels cannot be increased. Hence, a high definition display is not possible.

None of the cited references, either individually or combined, disclose all of these claimed features, and none realize or recognize the above advantages and uniformity of the film resulting from the claimed invention. Therefore, since there is no recognition of these

advantages, one skilled in the art would not combine these references to realize these advantages and arrive at the claimed invention.

The nonobviousness of the claimed invention is evidenced by the fact that others did not begin to use ideas similar to the present invention until after Applicants' invention. For example, the Examiner has not found a single reference showing the claimed invention. However, after Applicants' invention, references, such as US patent publication 2002/0076847 (Yamada et al.), US patent publication 2002/0179013 (Kido et al), and Van Slyke et al. "Linear Source Deposition of Organic Layers for Full-Color OLED", SID 02 Digest, p. 886-889 (2002)², show ideas similar to the present invention. If the present invention was obvious, these ideas would have surfaced prior to Applicants' invention.

Accordingly, it is respectfully submitted that the method of independent Claim 20 and those claims dependent thereon is nonobvious.

Further, it is respectfully submitted that the combination of references used in the rejection to arrive at the claimed invention can only be based on hindsight reconstruction and is improper.

More specifically, in the Final Rejection (for which the Office Action relies), the Examiner admits that Arai does not disclose some of the claimed limitations of the rejected claims. The Examiner, however, previously contended that it would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize as the evaporation source, the evaporation source of Grothe and to further modify the process of Arai so as to move the substrate and the evaporating sources relative to each other, as allegedly taught by Monk.³ In the Final Rejection, the Examiner repeats these contentions and adds a further contention that it

² Applicants are citing each of these references in the IDS submitted herewith.

³ Applicants respectfully disagree with these contentions by the Examiner.

would have been obvious to one of ordinary skill in the art to modify the process of Arai so as to utilize a shadow mask, as recited in independent Claim 20, in the claimed fashion. Applicants respectively disagree and submit that this rejection and combination are improper.

More specifically, independent Claim 20 is directed to a method of manufacturing an electroluminescence display device comprising transferring the substrate between chambers, and fixing a mask to the substrate wherein the mask is located between the substrate and the evaporation source, and wherein the substrate is repeatedly moved with respect to the first evaporation source during the evaporation of the first material. As explained above, these features are advantageous, for example, for preventing leakage and providing more pixels for the display device.

In the Office Action, the Examiner contends that Applicants are arguing particular features of the each reference individually. Applicants respectfully disagree. Applicants are showing that the combination is improper. In order to do so, it is necessary to discuss the various references.

For example, the Examiner relies on the evaporation source of Grothe. Grothe, however, discloses that “coating of wide surfaces, such as wide, running webs, ribbons and the like by vapor deposition requires high density of the vapor.” See col. 5, lns. 41-43 in Grothe. In addition, Grothe discloses a work surface 21 particularly wide tapes, webs, or the like. See col. 7, lns 9-10. Hence, Grothe does not disclose or suggest transferring a substrate between chambers. Moreover, Grothe discloses “the entire system is in vacuum, that is, enclosed in an evacuated vessel”, and that “movement of the web 21 is preferably continuous”. Col. 3, lns. 62-65. Therefore, Grothe does not disclose or suggest connecting chambers. Grothe also does not disclose or suggest to transfer the web between chambers. Further, Grothe does not disclose a

display device. Further, there is nothing in Arai or Grothe to teach one skilled in the art as to how one could allegedly incorporate the device from Grothe in the device in Arai. Accordingly, in light of the above teachings in Grothe which appear to teach away from the subject matter of the present invention, and the lack of teachings in Grothe relevant to the subject matter of Arai, it is respectfully submitted that there would have been no motivation for one skilled in the art to combine Arai and Grothe to try to arrive at the claimed invention, except when using the claimed invention as a guideline.

Additionally, while Monk teaches that, in a process where some wafers are coated from an evaporation source, it is known that “either the source of the samples must be moved relative to each other during treatment”, (emphasis added) Monk discloses a face-up method in which film formation is performed with the wafer surface, onto which a film is to be formed, facing upward. See e.g. Fig. 4 in Monk. Monk does not disclose or suggest a face-down method. Further, Monk does not disclose a display device or method for forming a display device. Therefore, there would have been no motivation for one skilled in the art to combine Arai and Monk to try to arrive at the claimed invention. Further, no explanation is provided for how one skilled in the art would incorporate Monk into Arai.

Accordingly, for at least the above-stated reasons, independent Claim 20 and those claims dependent thereon are not obvious, and the combination of references to reject these claims is improper. Therefore, these claims are patentable, and it is respectfully requested that this rejection be withdrawn.

Claims 37, 43, 48, 53, 64 and 75

The Examiner also rejects Claims 37, 43, 48, 53, 64 and 75 under 35 USC §103 as being

unpatentable over Arai et al. in view of Bennett (US 2,435,997) and Grothe et al. and Nagayama et al. This rejection is also respectfully traversed.

In the Office Action, the Examiner combines Arai, Grothe and Nagayama in the same manner discussed above, and further contends that it would have been obvious to one of ordinary skill in the art to modify the method of Arai so as to move the evaporation source relative to the substrate, as allegedly taught by Bennett.

For at least the reasons discussed above, independent Claim 37 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claims 38, 48, 56, 65 and 76

The Examiner also rejects Claims 38, 48, 56, 65 and 76 under 35 USC §103 as being unpatentable over Arai et al. in view of Bennett, Grothe et al., Nagayama et al. and Monk. This rejection is also respectfully traversed.

In the Office Action, the Examiner combines Arai, Grothe and Nagayama in the same manner discussed above, and further contends that it would have been obvious to further modify the method of Arai with the alleged teachings of Bennett and Monk.

For at least the reasons discussed above, independent Claim 38 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claims 39, 48, 53, 57, 66 and 77

The Examiner also rejects Claims 39, 48, 53, 57, 66 and 77 under 35 USC §103 as being

unpatentable over Arai et al. in view of Nagayama et al., Feuerstein et al (US 4,627,989), Bennett, and Yamamoto et al. (US 6,179,923). This rejection is also respectfully traversed.

In the Office Action, the Examiner asserts Arai and Nagayama in the same manner discussed above, and further contends that it would have been obvious to one of ordinary skill in the art to modify the method of Arai with the alleged teachings of Feuerstein, Bennett and Yamamoto

For at least the reasons discussed above, independent Claim 39 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claims 40, 48, 58, 67 and 78

The Examiner also rejects Claims 40, 48, 58, 67 and 78 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Feuerstein et al., Bennett, and Yamamoto et al. or in the alternative over Arai et al. in view of Nagayama et al., Feuerstein et al., Bennett, Monk, and Yamamoto et al. This rejection is also respectfully traversed.

In the Office Action, the Examiner combines the references in the same manner discussed above, contends that it would have been obvious to combine these references to arrive at the claimed invention, and contends that undisclosed features would be inherent in the references.

For at least the reasons discussed above, independent Claim 40 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claim 49

The Examiner also rejects Claim 49 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al. and further in view of Spitzer et al. (US 5,258,325). This rejection is also respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claims 54, 68, 71 and 79

The Examiner also rejects Claims 54, 68, 71 and 79 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Bennett, Grothe et al. and Yamamoto et al. This rejection is also respectfully traversed.

In the Office Action, the Examiner combines the references in the same manner discussed above, contends that it would have been obvious to combine the references to arrive at the claimed invention, and contends that the undisclosed features would be inherent in the references or obvious.

For at least the reasons discussed above, independent Claim 54 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claims 55, 69, 72 and 80

The Examiner also rejects Claims 55, 69, 72 and 80 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Bennett, Grothe et al., Monk, and

Yamamoto et al. This rejection is also respectfully traversed.

In the Office Action, the Examiner combines the references in the same manner discussed above, contends that it would have been obvious to combine these references to arrive at the claimed invention, and contends that undisclosed features would be inherent in the references.

For at least the above-stated reasons, independent Claim 55 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claim 59

The Examiner also rejects Claim 59 under 35 USC §103 as being unpatentable over Arai et al., in view of Nagayama et al., Bennett and Grothe et al; further in view of Spitzer et al. This rejection is also respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claim 60

The Examiner also rejects Claim 60 under 35 USC §103 as being unpatentable over Arai et al., in view of Nagayama et al., Bennett, Grothe et al. and Monk, further in view of Spitzer et al. This rejection is also respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claim 61

The Examiner also rejects Claim 61 under 35 USC §103 as being unpatentable over Arai et al., in view of Nagayama et al., Feuerstein et al., Bennett, and Yamamoto et al., further in view of Spitzer et al. This rejection is also respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claim 62

The Examiner also rejects Claim 62 under 35 USC §103 as being unpatentable over Arai et al., in view of Nagayama et al., Feurestein et al., Bennett and Yamamoto et al., or in the alternative over Arai et al., in view of Nagayama et al., Feuerstein et al., Bennett, Monk and Yamamoto et al., further in view of Spitzer et al. This rejection is respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claim 73

The Examiner also rejects Claim 73 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al., further in view of Mizutani et al. (US 6,326,726). This rejection is respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for

the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claims 81-88 and 92-100

The Examiner also rejects Claims 81-88 and 92-100 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al. This rejection is respectfully traversed.

In the Office Action, the Examiner combines the references in the same manner discussed above, contends that it would have been obvious to combine these references to arrive at the claimed invention, and contends that undisclosed features would be inherent in the references.

For at least the above-stated reasons, independent Claims 81, 85, 92, 95 and 98 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this rejection be withdrawn.

Claims 89-91

The Examiner also rejects Claims 89-91 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al. This rejection is respectfully traversed.

In the Office Action, the Examiner combines the references in the same manner discussed above, contends that it would have been obvious to combine these references to arrive at the claimed invention, and contends that undisclosed features would be inherent in the references.

For at least the above-stated reasons, independent Claim 89 and those claims dependent thereon are patentable over these cited references, and it is respectfully requested that this

rejection be withdrawn.

Claim 101

The Examiner also rejects Claim 10 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al., further in view of Spitzer. This rejection is respectfully traversed.

This claim is a dependent claim. Therefore, for at least the reasons discussed above for the independent claim, this claim would also be patentable. Accordingly, it is requested that this rejection be withdrawn.

Claims 102-104

The Examiner also rejects Claims 102-104 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk, Nagayama et al. and further in view of Bertelsen (US 3,110,620). This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable.

Further, as the Examiner admits, this feature is not disclosed in any of the cited references.

Accordingly, it is requested that this rejection be withdrawn.

Claims 105-107

The Examiner also rejects Claims 105-107 under 35 USC §103 as being unpatentable over Arai et al. in view of Bennett, Grothe et al., and Nagayama et al. and further in view of

Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 108-110

The Examiner also rejects Claims 108-110 under 35 USC §103 as being unpatentable over Arai et al. in view of Bennett, Grothe et al., Nagayama et al., and Monk and further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 111-113

The Examiner also rejects Claims 111-113 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Feurestein et al., Bennett, and Yamamoto et al. and further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 114-116

The Examiner also rejects Claims 114-116 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Feuerstein et al., Bennett, and Yamamoto et al. or in the alternative, over Arai et al., in view of Nagayama et al., Feuerstein et al., Bennett, Monk and Yamamoto et al. further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 117-119

The Examiner also rejects Claims 117-119 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Bennett, Grothe et al. and Yamamoto et al. further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 120-122

The Examiner also rejects Claims 120-122 under 35 USC §103 as being unpatentable over Arai et al. in view of Nagayama et al., Bennett, Grothe et al., Monk and Yamamoto et al. further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 123-128 and 132-138

The Examiner also rejects Claims 123-128 and 132-138 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al. further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Claims 129-131

The Examiner also rejects Claims 129-131 under 35 USC §103 as being unpatentable over Arai et al. in view of Grothe et al., Monk and Nagayama et al. further in view of Bertelsen. This rejection is respectfully traversed.

These claims are dependent claims. Therefore, for at least the reasons discussed above for the independent claims, these claims would also be patentable. Further, for the reasons explained above for Claims 102-104, these claims are also nonobvious.

Accordingly, it is requested that this rejection be withdrawn.

Therefore, it is respectfully submitted that the §103 rejections have been overcome, and it is requested that the rejections be withdrawn, and the claims allowed.

New Claims

Applicants are also adding new Claims 141-176 herewith.

New Claims 145-152 are directed to the feature that a gap between said first evaporation cells has a distance “a” and a distance between said first evaporation source and said mask is 2a to 100a or 5a to 50a. This feature is shown, for example, at page 6 of the present application. As explained therein, this feature is advantageous. It is respectfully submitted that such a feature is not disclosed or suggested by the cited references.

New Claims 141, 143 and 173 recite the feature that said material is organic. This feature is shown, for example, at page 1, lns. 18-19 of the present application.

New Claims 142, 144 and 174 recite the feature that the material is inorganic. This feature is shown, for example, at page 1, lns. 18-19 of the present application.

New Claims 153-155 recite the feature that during evaporation each of the first and second evaporation sources moves from one end of the substrate to the other end. This feature is shown, for example, at page 10, lns. 4-5 of the present application. None of the cited references disclose or suggest movement of both the evaporation sources and the substrate, as claimed. For example, as shown above, Monk only discloses movement of either one, not both.

New Claims 156-168 and 175 recite the feature that said display device is a passive matrix electroluminescence display device. This feature is shown, for example, at page 1, lns. 14-15 of the present application.

New Claim 169 includes the features that recites the mask has at least a rectangular shaped open portion, and a longitudinal direction of open portion is perpendicular to the first direction of the evaporation source. This feature is shown, for example, at page 8, lns. 23-25 and Fig. 2A of the present application.

New Claim 170 recites the feature that said second direction is orthogonal to the first direction. This feature is shown, for example, in Fig. 2A of the present application.

Claim 171 recites the features that said electroluminescence display device is a color display, the substrate is located above the evaporation source, a lower surface of the substrate is provided with thin films, and thin films of materials for emitting different colors are formed for each pixel. This feature is shown, for example, at page 1, ln. 27 and page 2, lns. 1-2 of the present application.

Claim 172 recites the feature that each of the evaporation sources has a length exceeding 300 mm along the first direction. This feature is shown, for example, at page 3, lns. 13-21 of the present application.

Claim 176 recites the feature that said electroluminescence display device is an active matrix electroluminescence display device. This feature is shown, for example, at page 1, lns. 14-15 of the present application.

In addition to the features recited in the claims, each of these dependent claims is patentable for at least the reasons discussed herein for the independent claims.

Therefore, it is requested that these new claims be entered, examined and allowed at this time.

If any fee is due for these new claims, please charge our deposit account 50/1039.

Information Disclosure Statement

Applicants filed an Information Disclosure Statement (IDS) on April 26, 2006. Applicants are also submitting an IDS herewith. It is respectfully requested that these IDSs be entered and considered prior to the issuance of any further action on this application.

If any further fee is due for these IDSs, please charge our deposit account 50/1039.

Conclusion


Accordingly, for at least the above-stated reasons, Applicants respectfully submit that the present application is in a condition for allowance and should be allowed.

If any further fee is due for this amendment, please charge our deposit account 50/1039.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

Dated: May 22, 2006


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